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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.        | CONFIRMATION NO. |
|---|-------------|----------------------|----------------------------|------------------|
| 10/091,743  | 03/06/2002  | Danielle A. Thomas   | 01-C-086<br>(STM101-01086) | 8460             |
| 7590 12/22/2005   |             |                      | EXAMINER                   |                  |
| Lisa K. Jorgenson, Esq.<br>STMicroelectronics, Inc.<br>1310 Electronics Drive<br>Carrollton, TX 75006 |             |                      | NGUYEN, DONGHAI D          |                  |
|   |             |                      | ART UNIT                   | PAPER NUMBER     |
|   |             |                      | 3729                       |                  |

DATE MAILED: 12/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/091,743

Applicant(s)

THOMAS ET AL.

Examiner

Donghai D. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 31-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 31-36 is/are rejected.
- 7) ☒ Claim(s) 3-9 and 37-40 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed on October 03, 2005 has been considered and made of record.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,441,467 to Toyosawa in view of US Patent 6,180,445 to Tsai.

This rejection is set forth in the prior Office Action mailed on 6/30/2005.

4. Newly added claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyosawa et al in view of Tsai as applied above further in view of Takiar et al.

Toyosawa/Tsai et al as applied and relied above do not teach the limitation of claims 31 and 32. Takiar et al teach the depositing a silicon oxynitride layer (22) over the at least one active circuit area; wherein the redistribution metal layer (28) is fabricated over the silicon oxynitride layer and depositing the polyimide layer (32) over at least one portion of the redistribution metal layer and over at least one portion of the silicon oxynitride layer (see Fig. 3)

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for protecting the active circuit area with shock absorbing and puncture-resistant layers (see Col. 2, lines 6-11). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modified Toyosawa/Tsai et al invention by utilizing the teaching of Takiar et al by depositing the silicon oxynitride and polyimide layer over the active circuit for protecting the active circuit area.

5. Newly added claims 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyosawa et al in view of Tsai as applied above, and further in view of US Patent 5,306,936 to Goto.

Regarding claims 33 and 35, Toyosawa/Tsai et al as applied and relied above do not teach the depositing a silicon oxynitride layer over at least a portion or all portion of the redistribution metal layer. Goto teach the depositing a silicon oxynitride layer (27 see Togo's Fig. 3) over at least a portion or all portion of the redistribution metal layer (26) as a water resisting layer (see Col. 4, lines 54-59). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Toyosawa/Tsai et al by depositing a silicon oxynitride layer over at least a portion or all portion of the redistribution metal layer as taught by Goto for providing a water resistant layer in order to protect the active circuit area.

Regarding the limitations of claims 34 and 36 also met as set forth above.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. In addition, claims 1, 2, 10 and newly added claims 31-32 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 4,723,197 to Takiar et al.

Regarding claims 1, Takiar et al disclose a method for fabricating an integrated circuit, comprising the steps of: fabricating a portion of the integrated circuit having at least one active circuit area (See Abstract lines 1-2); fabricating a redistribution metal layer (28, see Fig. 3) over the at least one active circuit area; depositing a polyimide layer (32) over at least a portion of the redistribution metal layer; and etching the polyimide layer to leave at least one portion of the redistribution metal layer open to receive at least one solder bump (30).

Regarding claims 2 and 10, Takiar et al disclose the fabricating at least one flat portion of the redistribution metal layer to receive the at least one solder bump and the redistribution metal layer using a last metal layer that is used to fabricate the active circuit area of the integrated circuit (see Fig. 3).

Regarding claims 31 and 32, Takiar et al disclose depositing a silicon oxynitride layer (22) over the at least one active circuit area; wherein the redistribution metal layer (28) is fabricated over the silicon oxynitride layer and depositing the polyimide layer (32) over at least one portion of the redistribution metal layer and over at least one portion of the silicon oxynitride layer (see Fig. 3).

***Response to Arguments***

8. Applicants' arguments filed October 03, 2005 regarding the rejected claims 1, 2 and 10 have been fully considered but they are not persuasive. Applicants argue that both Toyosawa and Tsai et al do not teach the silicone nitride layer to cover metal layer and exposing the underlying layer (see "Remarks" page 13, 1st paragraph and page 14, 2<sup>nd</sup> paragraph). The Examiner directs Applicants to Col. 15, lines 42-45 of Toyosawa et al reference which teach the above feature. Further, applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

9. Claims 3-9 and 37-40 are allowed.

***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghai D. Nguyen whose telephone number is (571)-272-4566. The examiner can normally be reached on Monday-Friday (9:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter D. Vo can be reached on (571)-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DN  
December 14, 2005

  
MINH TRINH  
PRIMARY EXAMINER